

### **REMARKS/ARGUMENTS**

This is in response to the Office Action dated November 30, 2009. This response is accompanied by a request for a three month extension of time and the associated fee of \$555.00. Accordingly, the applicant requests that this response be considered timely filed.

The current amendment addresses various subject matters of the invention related to the instance of using of a carbon dioxide scrubber in the conditional breathing circuit (CBC) in separate dependant claims. Hence, claims 1, 3, 25, 28 and 29 have been revised to remove reference to the formula: Flux of gas "X" = SGF ( $F_{EX} - F_{RBX}$ ), claim 11 has been revised to make it dependant on claim 1 and new claims 30 and 31 have been added.

The amendment to claim 11 and the introduction of new claims 30 and 31 do not add new matter. From page 42, line 1, it is evident that  $F_{EX}=F_{RBX}$  and it would be evident to a person skilled in the art that the ensuing formula (3) on page 42 is a clerical error and should read: Flux of gas "X" = SGF ( $F_{SX} - F_{RBX}$ ).

In particular, the invention is predicated on the discovery that the flux of any gas "X" in a CBC circuit (Conditional Breathing Circuit - see page 2 lines 7 to 9) can be far more readily determined without the inconvenience of measuring exhaled gas volumes or other inconveniences described at page 3, line 10 to page 4, line 19.

Since the patient is breathing on a circuit in which the first portion of the subject's breath is a gas with a known concentration of gas "X" and in which this gas is flowed to the subject in an amount which results in gas entering the circuit being less than the subject's alveolar ventilation, the balance of the gas in that breath already being equilibrated with the subject's alveoli (for example gas exhaled by the subject which has the same concentration of gas "X" as in the alveoli and is therefore neutral from the

standpoint of flux - no flux of gas "X" occurs due to this part of the breath), the amount of gas flowed to the subject is determinative of the alveolar ventilation (the volume of gas per unit time that is exchanged across the alveoli).

In these circumstances, it has been discovered that calculating the flux becomes a matter of multiplying this rate of gas exchange (which is equivalent to the SGF (Source gas flow - see page 1 line 18) by the difference in the fractional concentration of gas "X" in the source gas and the expired gas. The notion that the principles described above can be simply implemented as aforesaid is described at page 10, lines 10 to 12. These principles are disclosed as conditions required for the operation of the invention at page 11, lines 4 to 14.

The embodiment of the invention characterized in current claim 1 is a method of Determining the flux of any gas using a particular type of breathing circuit - a CBC (defined at page 2, line 7) - which could be used when a spontaneously breathing patient is undergoing anesthesia or which could be provided to a ventilated patient to breathe on.

A CBC is defined at page 2 as a breathing circuit in which the source gas flowed to the patient does not escape the circuit; only exhaled gas leaves the circuit. Therefore, since the volume of expired gas is not being measured (this is obviated by the contribution of the inventors) and the choice of circuit also obviates concern about what blend of inspired and exhaled gases is leaving the circuit (flux is therefore not affected by this variable), and alveolar ventilation is being controlled by the gas flow setting, the invention need only be concerned with the product of the inflow rate and the concentration difference between SGF and the end tidal gas. However, where a carbon dioxide absorbent is being used, the concentration of the gas X in the end tidal that is relevant is the concentration of that gas X before entry of the gas into the carbon dioxide gas absorber (where gas may be mixed and may not reflect the concentration of gas X in the end tidal gas). Hence, the term  $F_{EX}$  in the formula is replaced by term  $F_{RBX}$

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which merely reflects where in the circuit the concentration of gas X in the expired gas can be measured.

Applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

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